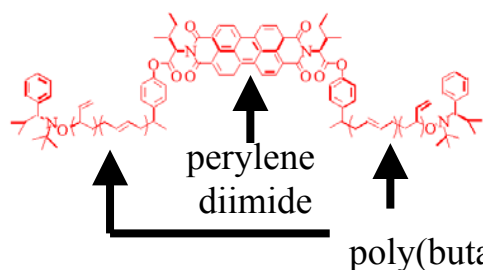


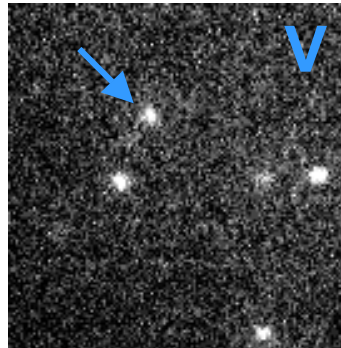
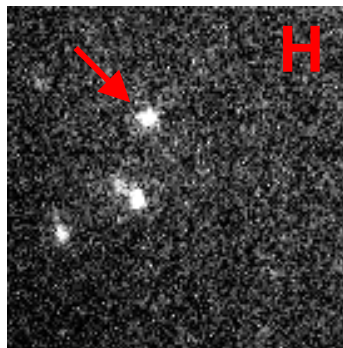
Single Polymer Chains March to Different Drummers

Grant T. Gavranovic, K.A. Willets, N.B. Bowden, S. Csihony, W.E. Moerner, R.M. Waymouth, G.G. Fuller

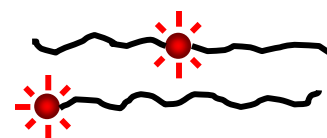
Stanford University, Departments of Chemical Engineering and Chemistry, DMR-0237247



Using ultrasensitive laser techniques, we can see each molecule!



— 1 μm



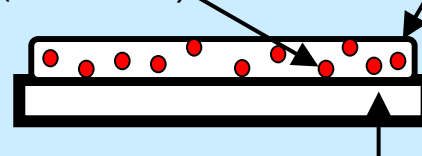
$M_w = 67800$

$M_w = 50700$

Two newly synthesized poly(butadiene) polymers have fluorescent beacons located at the center or the end of the chain. Using single-molecule polarization imaging, the orientation of the chain near the label can be determined as a function of time without ensemble averaging. Each molecule behaves differently, but we see that the end-label undergoes reorientations more often and with higher probability per molecule than the center-labeled form. This method will be applied to explore polymer dynamics of linear entangled polymers when the polymer is stretched.

Sample is labeled poly(butadiene) in a thin film of poly(butadiene).

Dye-labeled poly(butadiene) Poly(butadiene) film (~50 nm)



$M_w = 24800$

Glass cover slip

Figure not to scale